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NATIONAL RECOVERY ADMINISTRATION

APR 8 1936

DIVISION OF REVIEW

EVIDENCE STUDY

NO. 5

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OF

THE CHEMICAL MANUFACTURING INDUSTRY

Prepared by

AL F. O'DONNELL

AUGUST, 1935

PRELIMINARY DRAFT

(NOT FOR RELEASE: FOR USE IN DIVISION ONLY)

THE EVIDENCE STUDY SERIES

The EVIDENCE STUDIES were originally planned as a means of gathering evidence bearing upon various legal issues which arose under the National Industrial Recovery Act.

These studies have value quite aside from the use for which they were originally intended. Accordingly, they are now made available for confidential use within the Division of Review, and for inclusion in Code Histories.

The full list of the Evidence Studies is as follows:

- | | |
|-------------------------------------|---|
| 1. Automobile Manufacturing Ind. | 23. Mason Contractors Industry |
| 2. Boot and Shoe Mfg. Ind. | 24. Men's Clothing Industry |
| 3. Bottled Soft Drink Ind. | 25. Motion Picture Industry |
| 4. Builders' Supplies Ind. | 26. Motor Bus Mfg. Industry (Dropped) |
| 5. Chemical Mfg. Ind. | 27. Needlework Ind. of Puerto Rico |
| 6. Cigar Mfg. Industry | 28. Painting & Paperhanging & Decorating |
| 7. Construction Industry | 29. Photo Engraving Industry |
| 8. Cotton Garment Industry | 30. Plumbing Contracting Industry |
| 9. Dress Mfg. Ind. | 31. Retail Food (See No. 42) |
| 10. Electrical Contracting Ind. | 32. Retail Lumber Industry |
| 11. Electrical Mfg. Ind. | 33. Retail Solid Fuel (Dropped) |
| 12. Fab. Metal Prod. Mfg., etc. | 34. Retail Trade Industry |
| 13. Fishery Industry | 35. Rubber Mfg. Ind. |
| 14. Furniture Mfg. Ind. | 36. Rubber Tire Mfg. Ind. |
| 15. General Contractors Ind. | 37. Silk Textile Ind. |
| 16. Graphic Arts Ind. | 38. Structural Clay Products Ind. |
| 17. Gray Iron Foundry Ind. | 39. Throwing Industry |
| 18. Hosiery Ind. | 40. Trucking Industry |
| 19. Infant's & Children's Wear Ind. | 41. Waste Materials Ind. |
| 20. Iron and Steel Ind. | 42. Wholesale & Retail Food Ind. (See No. |
| 21. Leather | 43. Wholesale Fresh Fruit & Veg. 31) |
| 22. Lumber & Timber Prod. Ind. | |

In addition to the studies brought to completion, certain materials have been assembled for other industries. These MATERIALS are included in the series and are also made available for confidential use within the Division of Review and for inclusion in Code Histories, as follows:

- | | |
|------------------------------------|--|
| 44. Wool Textile Industry | 49. Household Goods & Storage, etc. (Dropped) |
| 45. Automotive Parts & Equip. Ind. | 50. Motor Vehicle Retailing Trade Ind. (Dropped) |
| 46. Baking Industry | 51. Retail Tire & Battery Trade Ind. |
| 47. Canning Industry | 52. Ship & Boat Bldg. & Repairing Ind. |
| 48. Coat and Suit Ind. | 53. Wholesaling or Distributing Trade |

L. C. Marshall
Director, Division of Review

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THE CHEMICAL MANUFACTURING INDUSTRY

Foreword

The data presented in this report have been assembled almost entirely from governmental sources. Much of the material has been taken from the Census of Manufactures reports on two industries, "Chemicals Not Elsewhere Classified," and "Explosives," which, when combined, represent a classification roughly comparable with the Code definition as explained in Chapter I. Other government data used are those gathered by the Bureau of Labor Statistics and the Bureau of Foreign and Domestic Commerce. Supplementary data have been obtained from the Oil, Paint, and Drug Reporter, Chemical and Metallurgical Engineering, from material released by the Chemical Alliance, Incorporated, which acted as the Code Authority for the Industry, and from the Chemical Foundation, Incorporated, a corporation organized to take over German patents during the war and whose present activity consists largely of promoting the general interests of the Industry through the distribution of literature.

Due to lack of pertinent information, some of the topics called for in the first, second, third, fourth, and sixth sections of the "Outline for Collection of Evidence" have not been discussed in this report. Section V of the outline was considered inapplicable to this Industry since the Code contained no trade practice provisions.

Chapter I

THE NATURE OF THE INDUSTRY

Definition of the Industry

The Code definition restricts the Chemical Manufacturing Industry to "the production and sale by the producer of heavy, industrial, and fine chemicals, and their by-products unless separate codes ... are submitted"

Many chemical-producing industries which, normally would otherwise have operated under the Chemical Manufacturing Industry Code, chooseto submit and operate under separate codes.

The Census of Manufactures does not include a classification which is strictly comparable with the Industry as defined in the Chemical Manufacturing Code. However, a combination of the data included under the Census Industries No. 698, "Chemicals Not Elsewhere Classified" and No. 613, "Explosives" was considered sufficiently representative of the codified Industry to be used in this survey. The principal differences between the scope of these two classifications combined and the Industry, as defined in the Code, are that the former does not include ethyl alcohol, which accounts for about 5 per cent of the value of output of the codified Industry, nor by-product coke produced under the Chemical Manufacturing Code. The combined Census classifications, furthermore, include some items produced under Codes for the Lye Industry, Plastic Fabricator, and Natural Organic Products. It is believed that the combined Census classifications and the Code classification have about 90 per cent of their respective coverages in common.

Total Number of Establishments

As shown in Table 1, below, the number of establishments operating in the Chemical Manufacturing Industry declined from 646 in 1929 to 607 in 1933.

Number of Establishments by Principal States

The number of establishments in each of the principal chemical-producing states is shown in Table I. New Jersey, New York, and Pennsylvania contain the largest number of establishments, in the order mentioned. Large numbers are also located in Ohio, California and Illinois.

Number of Members of the Industry

A good idea of the number of members of the Chemical Industry may be obtained from the results of a survey undertaken in April, 1934, by The Chemical Alliance, Incorporated, the leading trade association in the Industry. Questionnaires were sent to all members of the Alliance and returns were received from 337 chemical companies which covered the operations of 598 distinct factory units. 1/ This number compares very well with the total of 607 plants shown in the 1933 Census.

1/ The Chemical Alliance, Incorporated, "Report of the Committee on Statistics Showing Distribution of Labor and Basic Wage Rates for the Chemical Manufacturing Industry," (November 1934), p. 1.

TABLE I

Number of Establishments, by Principal States

State	Number of Establishments		
	1929	1931	1933
U. S. Total	646	636	607
Alabama	8	7	7
Arkansas	5	2	1
California	51	54	54
Colorado	5	5	4
Connecticut	7	7	9
Illinois	45	41	39
Indiana	10	11	10
Iowa	5	5	6
Kansas	4	3	3
Kentucky	6	4	4
Maryland	9	10	10
Massachusetts	16	21	19
Michigan	15	19	18
Minnesota	4	4	3
Missouri	14	12	12
New Jersey	108	106	97
New York	101	92	85
Ohio	53	60	55
Oklahoma	5	3	3
Pennsylvania	70	71	71
Rhode Island	7	6	4
Tennessee	10	10	11
Texas	11	11	16
Virginia	11	10	12
Washington	11	12	7
West Virginia	19	18	14
Wisconsin	7	6	6
Other States	23	26	27

Source: Census of Manufacturers. "Chemicals not Else-
where Classified" and "Explosives."

Value of Products

The total value of chemicals produced in the Industry as defined in the Code decreased from \$844,143,000 in 1929 to \$616,026,000 in 1931, and to \$525,231,000 in 1933. The value of the more important chemical products is shown in Table II. The decrease in value has been general, but the groups classified under "Miscellaneous Chemicals" and "Explosives" have apparently been the most seriously affected.

A similar summary of changes in the volume of production is not available.

Consumption of Chemicals

An indication of the consumption of chemicals by other industries is given in Table III. The information presented is confined to three principal products -- sulphuric acid, soda ash, and caustic soda. A wide variety of industries purchase these products. The fertilizer and petroleum-refining industries were the largest users of sulphuric acid in 1934. The largest quantity of soda ash was used by the Chemical Industry itself; the second largest, by glass workers. The Rayon Industry used a large share of caustic soda.

The location of six of the principal chemical-consuming industries is shown in the Appendix Tables I to VI, inclusive. These tables are presented merely to indicate the wide geographic scatter of the consuming industries.

Capital Investment

Complete figures on the capital invested in the Chemical Industry are not available. Francis P. Garvan, President of The Chemical Foundation, Incorporated estimated that in 1934 the 598 plants mentioned above had a capital investment of over a billion dollars. ^{1/}

^{1/} Garvan, Francis P., In the Matter of a Proposed Reciprocal Trade between the United States and Switzerland, published by The Chemical Foundation, Incorporated (1935), p. 41.

TABLE II

Value of Production, by Kind of Product
(In thousands)

Kind of Product	Value of Production			
	1929	1931 ^{a/}	1931 ^{b/}	1933
Grand Total ^{c/}	\$844,143	\$616,096	\$603,445	\$525,231
Total "Chemicals Not Elsewhere Classified"	781,190	575,827	563,176	496,186
Acids	98,620	66,433	65,096	55,487
Nitrogen & Fixed Nitrogen	38,337	33,483	33,262	30,756
Sodium Compounds	137,655	108,591	104,025	95,107
Potassium Compounds	9,998	8,112	8,112	7,434
Alums & Other Aluminum Compounds	15,949	10,761	10,621	11,501
Coal Tar Products	130,652	103,088	100,532	107,273
Plasters	39,734	27,847	27,346	26,381
Miscellaneous Chemicals	310,245	217,512	214,182	162,247
Total Explosives	62,953	40,269	40,269	29,045
Dynamite	36,989	22,024	22,024	15,223
Permissible Explosives	8,375	5,820	5,820	4,154
Nitroglycerin	2,447	434	434	451
Blasting Powder	7,750	4,909	4,909	4,056
Fuse Powder	427	293	293	186
Gunpowder Block & Other Explosives	6,965	6,789	6,789	4,975

Source: Census of Manufactures, "Chemicals, Not Elsewhere Classified" and "Explosives."

^{a/} Due to changes in Census schedule these figures are comparable only with 1929.

^{b/} Due to change in Census schedule these figures are comparable only with 1933.

^{c/} The grand totals do not agree with totals shown in Tables VII and IX since the above include chemicals made as secondary products in other Industries, and exclude other products, not normally belonging to the Chemical Manufacturing Industry, which were made in chemical manufacturing plants.

TABLE III

Estimated Distribution of Sulphuric Acid, Soda Ash and Caustic Soda, Consumed in United States by Various Industries, 1934

Consuming Industries	Thousands of Tons		
	Sulphuric Acid and (Basis 50° Baume)	Soda Ash	Caustic Soda
Total	5,660	1,696	659
Fertilizer	1,450	-	-
Petroleum Refining	1,100	8	80
Chemicals	765	580	109
Coal Products	535	-	-
Iron and Steel	475	-	-
Other Metallurgical	390	-	-
Paint and Pigment	210	-	-
Rayon and Cellulose Fiber	230	-	140
Textile	75	28	33
Glass Works	-	480	-
Soap	-	175	93
Cleansers & Modified Sodas	-	100	-
Pulp and Paper	-	70	37
Water Softening	-	40	-
Lye	-	-	34
Rubber Reclaiming	-	-	9
Vegetable Oil	-	-	9
Exports	-	45	65
Miscellaneous	250	170	50

Source: Oil, Paint and Drug Reporter, May 27, 1935, Page 32;
(from "Chemical and Metallurgical Engineering Statistics").

Chapter II
LABOR STATISTICS

Number of Employees

The average number of employees in the Chemical Manufacturing Industry was higher in 1934 than in 1929. Changes in employment since 1929 may be summarized as follows: 1/

Average for 1929	67,813 employees
Average for 1931	53,255 employees
Average for 1933	57,358 employees
Average for 1934	71,500 employees

Seasonality of Employment

There appears to be little seasonal variation in employment in the Industry considered as a whole. The monthly data for 1934, which are assembled in Table IV, show that the number of employees at work in November, the low month, was only 7 per cent below the peak in July. There was about the same variation in total man-hours. However, if information were available for various branches of the Industry, seasonal fluctuation for the individual branches would probably appear more pronounced than it does in the totals where the seasonal variation of one branch may be offset by that of another.

Number of Employees per Establishment

A few establishments employ a very large proportion of the total workers in the Industry. As can be seen from Table V, the 10 per cent of the plants which employed more than 250 employees in 1934 accounted for over 60 per cent of the total employees. The remaining workers were scattered among a large number of small plants.

TABLE IV
Seasonality of Employment, 1934

Week Ending Nearest the 15th	Estimated Number of Employees	Estimated Weekly Man-Hours (Thousands)	Estimated Weekly Payroll (Thousands)
Average	71,500	2,743	\$1,580
January	69,300	2,692	1,481
February	69,610	2,705	1,506
March	71,310	2,743	1,526
April	73,480	2,857	1,645
May	73,680	2,730	1,618
June	73,850	2,825	1,642
July	73,950	2,858	1,646
August	73,130	2,822	1,647
September	71,410	2,677	1,571
October	70,390	2,730	1,581
November	69,150	2,642	1,554
December	68,720	2,639	1,540

Source: Basic data from the Bureau of Labor Statistics, Trend of Employment.

B.L.S. indexes for "Chemicals" and "Explosives" have been multiplied by Census base figures for "Chemicals Not Elsewhere Classified" and "Explosives" and adjusted by NRA to 1933 Census totals.

1/ See Tables IV and VI.

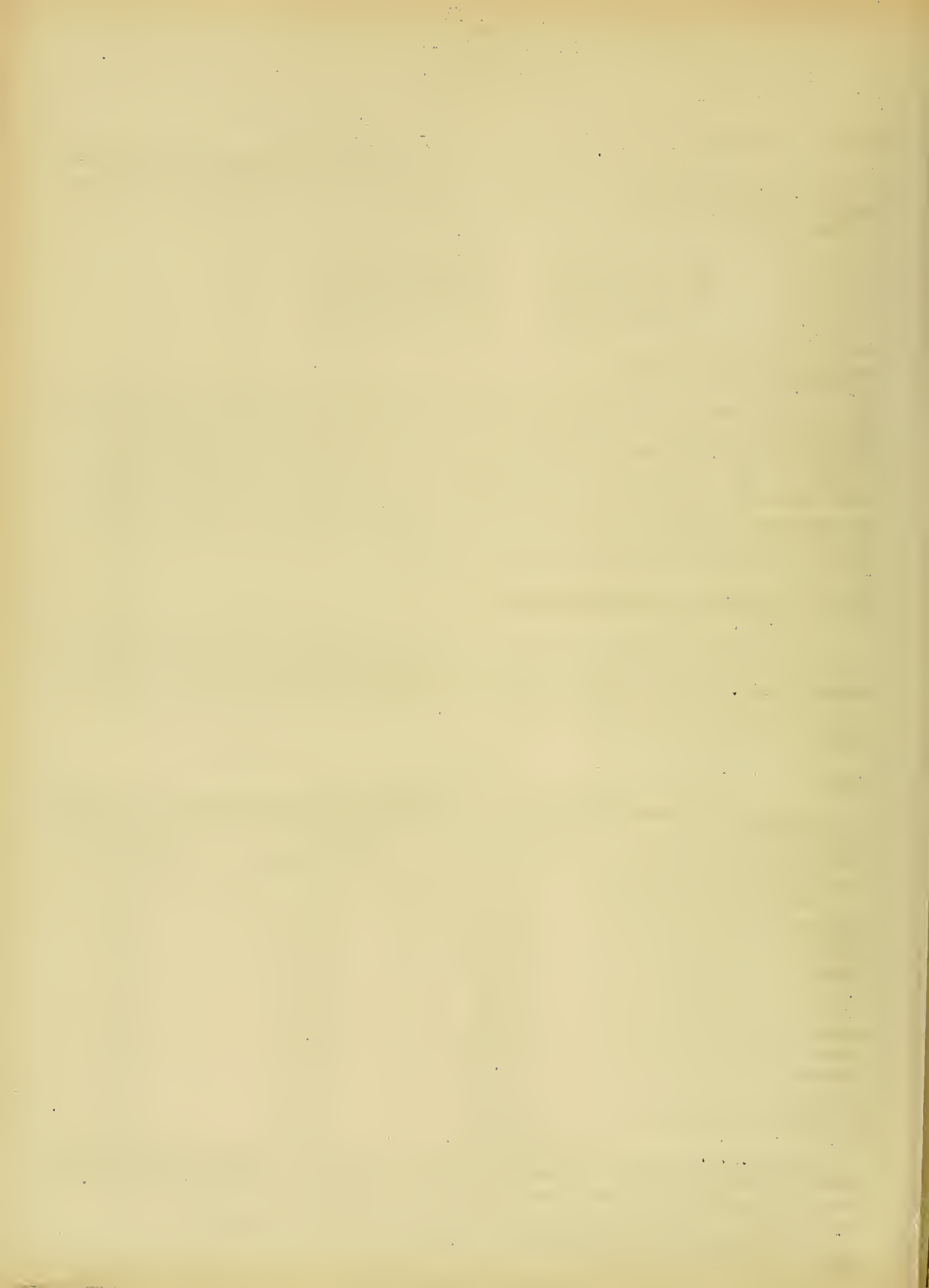


TABLE V

Establishments Classified According to
Number of Factory Workers, April, 1934

Number of Factory Workers per Establishment	Number		Per Cent of Total Classified	
	Establish- ments	Employees	Establish- ments	Employees
No employees	20 ^a / _a	-	3.3	-
1-5 employees	82	246	13.7	0.4
6-20 employees	151	1,752	25.3	2.9
21-50 employees	133	4,363	22.2	7.3
51-100 employees	79	5,544	13.2	9.2
101-250 employees	72	11,410	12.0	19.0
251-500 employees	31	10,493	5.2	17.5
501-1,000 employees	23	15,660	3.8	26.1
1,000 or more employees	7	10,645	1.2	17.7
Total Classified	598	60,113	100.0	100.0
Not Classified	-	9,832	-	-
Total	-	69,945	-	-

Source: The Chemical Alliance, Incorporated, "Report of the Committee on Statistics Showing Distribution of Labor and Basic Wage Rates for the Chemical Manufacturing Industry." (November 1934), p. 2.

^a/ Not operating

Note: There were 19,103 office workers in addition to the above, thus making a total of 89,048 employees.

Annual Wages

The total wage bill of the Industry declined from \$103,167,903 in 1929 to \$71,932,554 in 1931, and still further to \$63,364,000 in 1933. Comparable Census data are not available for 1934, but by multiplying the estimated average weekly payroll of \$1,580,000, shown in Table IV, by 52 weeks, we arrive at a figure of \$82,160,000 for the estimated annual payroll in 1934. From this it would appear that earnings have not improved to the same extent as employment, for it has previously been pointed out that 1934 employment was above the 1929 level.

Employment and annual wages in the principal chemical producing states are shown in Table VI. New Jersey and New York have the largest number of employees and the largest payrolls. Ohio, Pennsylvania, and Illinois are also important centers.

Per Cent Labor Cost is of Total Value of Product

Wages form a comparatively small proportion of the total value of chemical products. The percentage has varied little since 1929, for, as can be seen from Table VII, labor costs formed about 12 per cent of the total value in 1929, 1931 and 1933.

TABLE VI

Number of Establishments, Number of Employees, and Wages Paid, By States a/

State	Number of Establishments	1929		1931		1933			
		Average Number of Employees	Wages Paid	Average Number of Employees	Wages Paid	Average Number of Employees	Wages Paid		
U. S. Total	646	67,813	\$103,167,903	636	53,255	\$71,932,554	607	57,358	\$63,364,00
California	46b/	2,132b/	3,438,495b/	54	2,362	3,610,791	54	2,635	3,371,70
Illinois	45	4,010	6,213,936	41	3,853	5,041,712	39	3,767	3,724,11
Indiana	9	1,174	1,501,379	10	760	1,029,941	9	906	851,00
Maryland	9	1,236	1,512,968	10	752	1,050,244	10	830	928,00
Massachusetts	15	2,936	4,016,327	20	2,711	3,406,414	18	2,367	2,206,00
Michigan	13	5,414	9,114,215	17	4,192	6,357,703	16	4,712	5,833,00
Missouri	14	1,217	1,769,970	12	1,084	1,145,936	12	1,137	1,220,239
New Jersey	103	13,504	20,746,134	101	9,469	13,504,933	93	11,923	13,387,000
New York	99	13,007	20,870,140	90	9,386	12,843,609	84	8,923	10,969,000
Ohio	58	4,506	7,044,386	60	3,504	4,777,292	55	4,339	4,748,735
Pennsylvania	70	4,401	6,425,993	71	3,616	4,716,547	71	3,502	3,639,234
Tennessee	8	1,360	1,901,489	9	1,062	1,172,264	10	2,007	1,664,000
Virginia	11	2,446	3,051,032	10	1,693	2,374,109	12	1,810	2,078,000
West Virginia	14	1,968	2,947,589	14	2,060	2,865,387	12	2,166	2,484,000
All Other States	130	8,502	12,213,850	117	6,751	8,035,672	112	6,334	6,259,858

Source: Census of Manufactures, "Chemicals not Elsewhere Classified," and "Explosives."

a/ The notes below when read in connection with the footnote references in the body of the table indicate the number of explosive plants in given states for which figures on employees and wages were not given separately. The number of plants, employees, and amount of wages are therefore included in "All Other States."

b/ Three plants
 c/ One plant.
 d/ One plant.
 e/ Two plants
 f/ Five plants in 1929 and 1931; 4 in 1933.
 g/ Two plants in 1929 and 1931; 1 in 1933.
 h/ Two plants in 1929; 1 in 1931 and 1933.
 i/ Five plants in 1929; 4 in 1931; 2 in 1933.

TABLE VII

Total Value of Product, Total Labor Cost, and
Total Cost of Materials

Year	Total Value of Product ^{a/} (Thousands)	Total Labor Cost		Total Materials Cost	
		Amount (Thousands)	Per Cent of Total	Amount (Thousands)	Per Cent of Total
1929	\$810,588	\$103,163	12.7	\$395,341	48.8
1931	579,434	71,933	12.4	265,587	45.8
1933	511,609	63,364	12.4	234,158	45.8

Source: Census of Manufactures, "Chemicals not Elsewhere Classified,"
and "Explosives."

^{a/} The totals shown here do not agree with those shown in Table II,
since the above do not include chemicals made as secondary products
in other industries, and include other products, not normally be-
longing to the Industry but made in chemical manufacturing plants.

Hourly and Weekly Wages and Hours per Week

Hourly wage rates in this Industry are high in comparison with most other
industries. The average in 1929 was 65.5 cents; in 1933 it was down to 56.2
cents, but it rose to 61.6 cents in 1934.

Average hours worked per week have decreased since 1931. In 1929 and 1931
the average working week was about 45 hours; in 1933, 40.7 hours; and in 1934,
38.4 hours.

Weekly earnings are affected both by wage rates and the length of the
working week. Thus, in the Chemical Industry the increase in hourly earnings
in 1934 has been counteracted by the reduction in hours, so that weekly earn-
ings in 1934 averaged only \$23.67 as compared with \$23.13 in 1933. In 1929 the
average was almost \$30. The information pertaining to hours and earnings is
summarized in Table VIII.

Employees under 16 Years of Age

Very few children have been employed in the Chemical Industry. The Census
of Occupations showed that only 773 "operatives" and 465 "laborers" from 10 to
15 years old were employed in "Chemical and Allied Industries" in 1930. This
classification is much broader than the one used in this report, since it in-
cluded, among others, rayon, fertilizer, charcoal, coke, gas, and petroleum
refinery workers who would be excluded from the Chemical Industry as defined
by the Code.

TABLE VIII

Average Hourly and Weekly Wages and Average Hours Per Week a/

Year	Average Hourly Wages	Average Weekly Earnings	Average Weekly Hours
1929	\$0.655	\$29.67	45.3
1931	.607	27.54	45.4
1933	.562	23.13	40.7
1934	.616	23.67	38.4

Source: Data for 1929 and 1931 are National Industrial Conference Board figures, adjusted by the Division of Research and Planning, NRA, to correspond with Bureau of Labor Statistics figures which have been available since 1932.

a/ Weekly averages based upon data for the week ending nearest the 15th of each month.

Chapter III

MATERIALS: RAW AND SEMI-PROCESSED

Cost of Raw Materials

The Chemical Industry spent \$395,341,000 for raw materials, fuel, and electric power in 1929, \$265,537,000 in 1931, and \$234,158,000 in 1933. As shown in Table VII above, the cost of raw materials is a very important factor in the total value of products. In 1929 raw materials formed almost 49 per cent of the total value, and in 1931 and 1933, about 46 per cent.

Domestic Sources of Raw Materials

The states in which the principal raw materials used by the Chemical Industry are produced are shown graphically in Map I. There are no figures available on the total quantities or value of each of these materials consumed by the Chemical Industry, nor on the proportions of the total production of these raw materials which are converted into chemicals.

The map cannot show precisely the sources of materials but an indication of the interstate movement of raw materials can be obtained from it. For instance, New Jersey, which has been shown to be one of the two leading states in the Chemical Manufacturing Industry, is not shown on this map as supplying any raw materials for the Industry. This statement is, of course, a broad generalization and should not be taken too literally.

MAP. I



Source: Taken from The Chemical Foundation, Inc., "A Proposed Treaty Between the United States and Switzerland," p. 93.

Primary sources are:
Mineral Yearbook, 1932, 1933
Yearbook of Agriculture, 1933
Census of Manufactures, 1931

Chapter IV

PRODUCTION AND DISTRIBUTION

Vertical Integration

The trend of corporate development in the Chemical Industry has been toward consolidation and integration. The large organizations often control all stages of processing from basic raw materials to consumer's goods. This has been due to the marked economies resulting from large scale production, continuous operation, and recent developments of processes for the efficient use of by-products.

The integration of the Industry eliminates the distribution problem of some of the plants, as their outputs are taken up by affiliated companies. As a result of the intra-industry consumption of chemicals most products of the Chemical Industry are in general sold and shipped in bulk so that only about 40 per cent of the selling price of chemical products represents distribution costs. 1/ Only a relatively small percentage of the output of the Chemical Manufacturing Industry is purchased by the ultimate consumer in its original form.

Value of Products in Principal States

The value of chemicals and explosives produced in the various states is shown in Table IX. For some states the value of explosives was not available, so that the value of those states is somewhat understated, and to the same extent the value shown in "All Other States" is overstated. New York and New Jersey are the leading producing states; these two states in 1933 produced about 38 per cent 2/ of the total value. Michigan, Ohio, Pennsylvania, and Illinois also produce large amounts of chemicals.

There are no figures to indicate the total volume of chemicals produced in each state.

Interstate Movement of Selected Products

The interstate movement of chemical products is illustrated by Maps II and III which show the states in which sulphuric acids and alkalis are produced and consumed.

Value of Exports

The value of important exports of chemicals produced in the Industry as defined by the Code declined from \$56,092,000 in 1929 to \$32,185,000 in 1933. In 1934 there was noticeable improvement and the value of exports rose to \$40,310,000. A summary of chemical exports is contained in Table X. The groups shown in this table have been selected because they appeared to correspond most closely with the Code definitions of the Chemical Manufacturing Industry.

1/ Haynes, William. Chemical Economies. Van Nostrand Co., New York (1933) p.104

2/ This does not include the value of "explosives" produced in New York and New Jersey.

TABLE IX

Value of Products Produced, by Principal States a/

State	Value of Production in Each State (Thousands)		
	1929	1931	1933
U. S. Total	\$810,588	\$579,434	\$511,609
California	24,636 <u>b/</u>	26,085	26,319
Illinois	64,513	47,681	33,117
Indiana <u>c/</u>	13,798	7,051	7,111
Maryland	12,942	7,153	7,345
Massachusetts <u>d/</u>	19,103	14,700	12,697
Michigan <u>e/</u>	53,183	36,870	37,707
Missouri	19,425	13,150	12,772
New Jersey <u>f/</u>	155,783	111,887	97,162
New York <u>g/</u>	168,629	110,325	96,496
Ohio	47,906	36,515	37,949
Pennsylvania	60,081	35,189	33,389
Tennessee <u>h/</u>	18,820	17,443	13,609
Virginia	20,682	20,917	18,833
West Virginia <u>i/</u>	22,859	21,741	19,484
All Other States	108,128	72,727	57,619

Source: Census of Manufactures, "Chemicals not Elsewhere Classified," and Explosives."

a/ The notes below when read in connection with the footnote references in the body of the table indicate the number of explosive plants in given states for which figures on value of products were not given separately. The value of products for these plants is therefore included in "All Other States."

b/ Three plants.
c/ One plant.
d/ One plant.
e/ Two plants.
f/ Five plants in 1929 and 1931; 4 in 1933.

g/ Two plants in 1929 and 1931; 1 in 1933.
h/ Two plants in 1929; 1 in 1931 and 1933.
i/ Five plants in 1929; 4 in 1931; 2 in 1933.

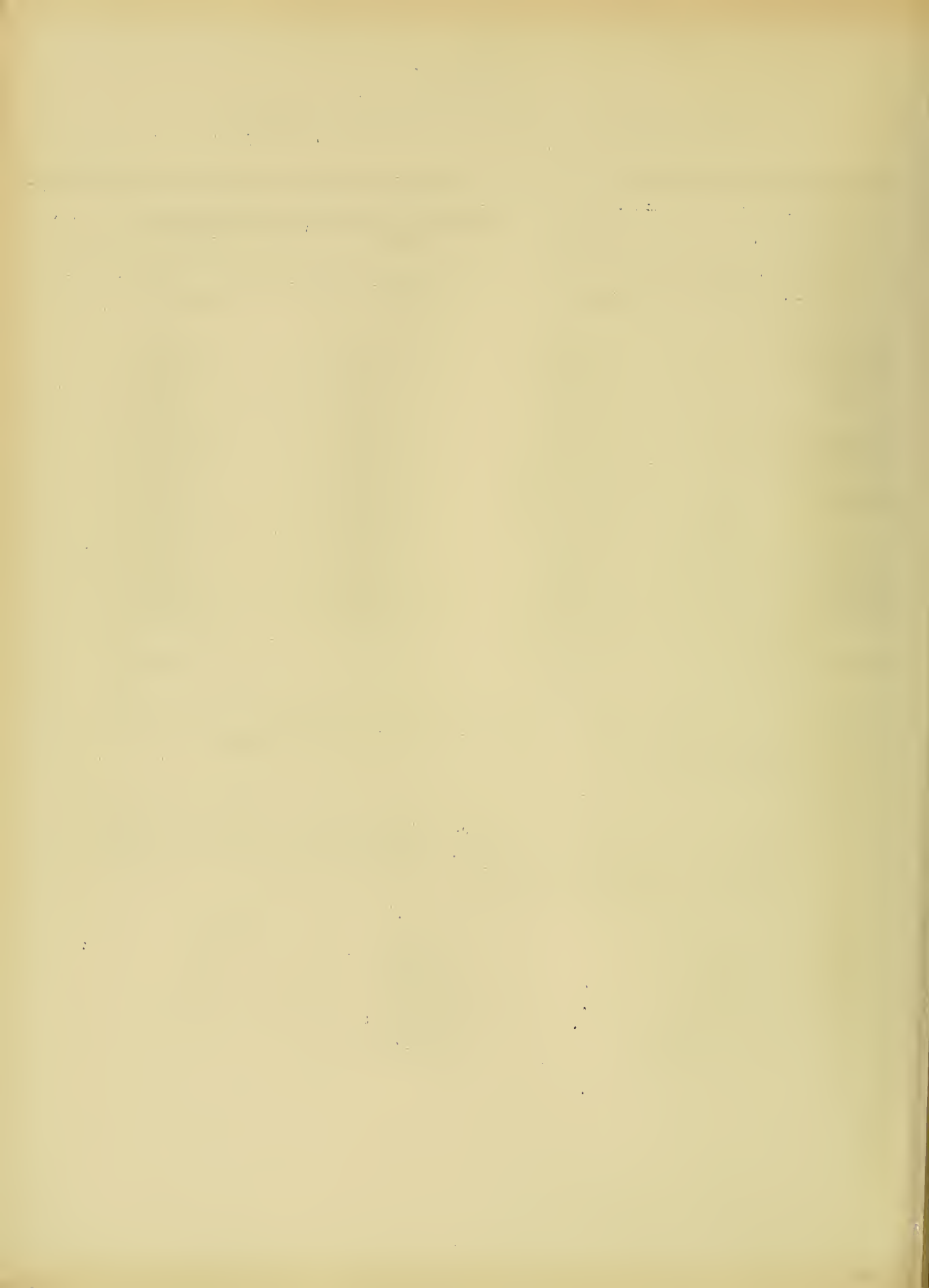


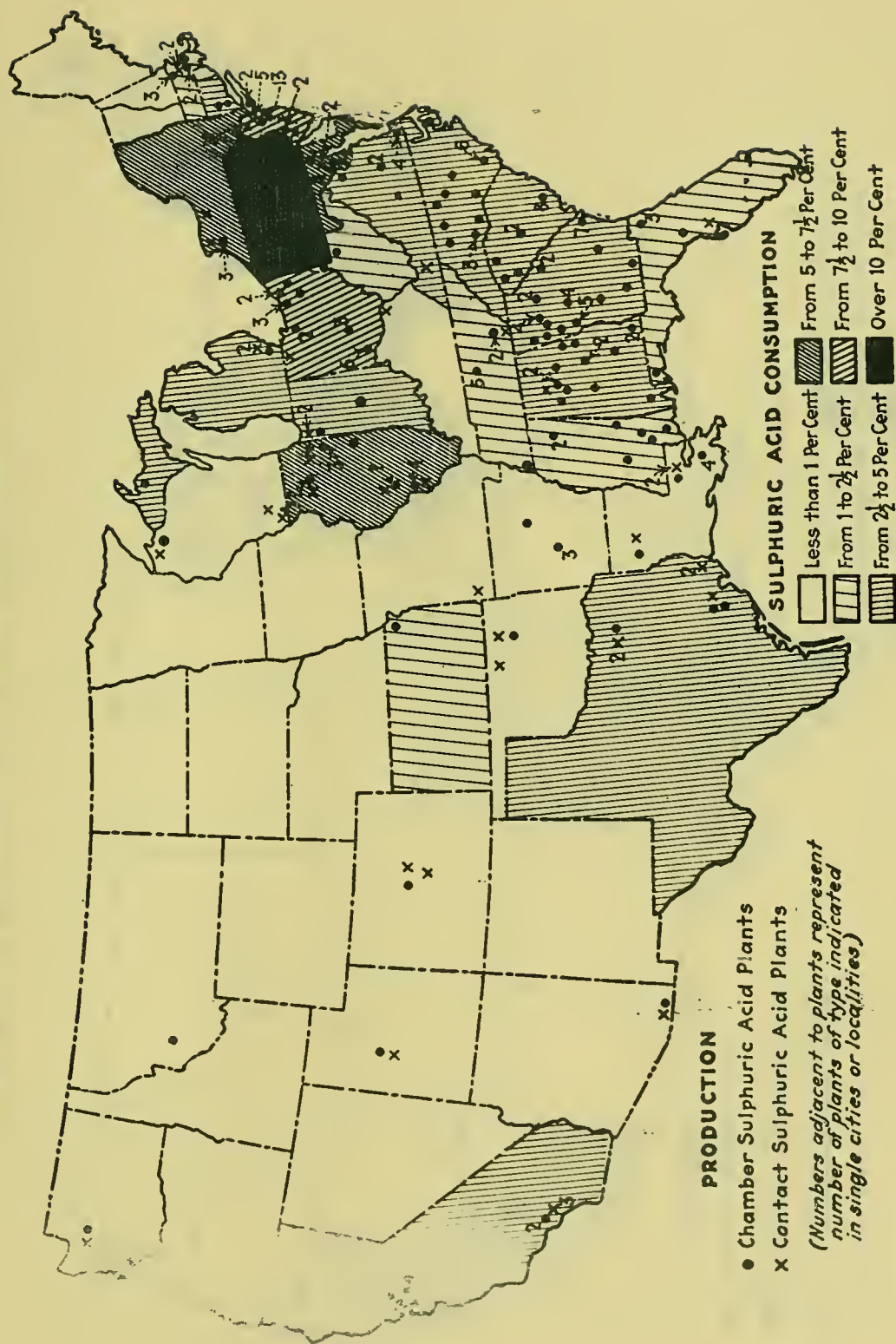
TABLE X

Value of Selected Chemicals Exported

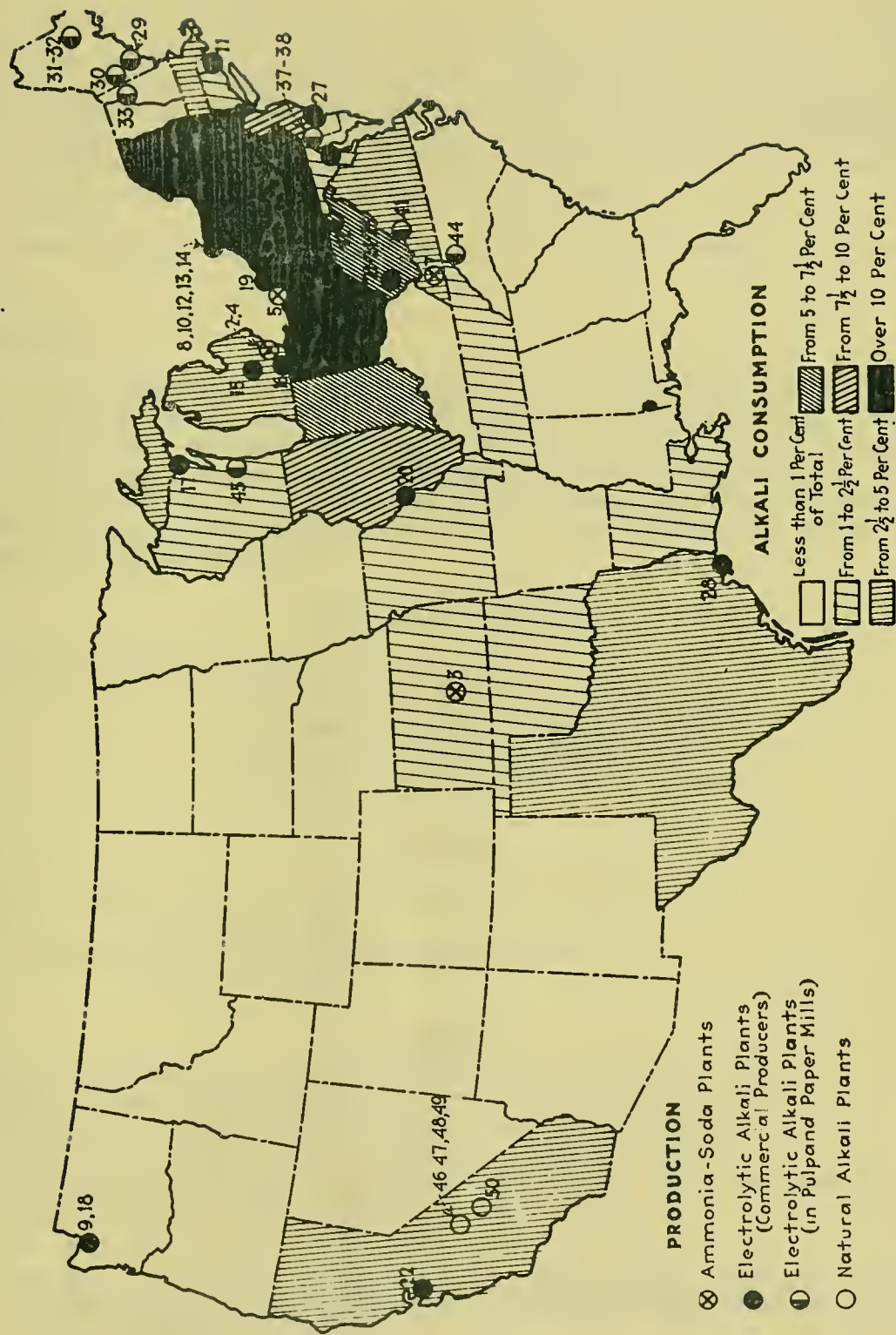
Item	Value of Exports (Thousands)			
	1929	1931	1933	1934
Coal-Tar Products	\$18,061	\$10,308	\$12,421	\$13,264
Industrial Chemicals, Exclusive of Com- pressed and Liquefied Gases	27,091	18,947	15,973	20,730
Nitrogenous Fertilizer Materials	7,526	4,828	2,729	4,940
Explosives	3,414	1,177	1,062	1,376
Total	56,092	35,260	32,185	40,310

Source: Bureau of Foreign and Domestic Commerce, Monthly Summary of Foreign Commerce of the United States (December issues).

Where Heavy Chemicals Are Made and Consumed



Where Heavy Chemicals Are Made and Consumed



Chapter V

GENERAL INFORMATION

Trade Associations

Important trade organizations in the Chemical Industry are: The Chemical Alliance, Inc.; Synthetic Organic Chemical Manufacturers' Association; and Manufacturing Chemists' Association of the United States. Membership lists showed 310 members of the Chemical Alliance, Inc.; 42 members of Synthetic Organic Chemical Manufacturers' Association, and 81 members of Manufacturing Chemists' Association, at the end of 1934. ^{1/} The lists of members are overlapping as some companies appear on all three lists.

The Chemical Alliance, Inc., which has the largest membership, sponsored the Code.

List of Experts

It is understood that the men listed below have not been consulted in any way regarding their potential use as experts in connection with evidence as to the interstate character of these industries and we have no information available as to their education, experience and other qualifications. In most instances leaders in the trade have designated these individuals as men best qualified to discuss the particular segments of the industry for which we are suggesting them as experts.

Solvents and Alkalies

Robert T. Baldwin, Chemists Club Building,
52 - East 41st Street, New York City
Secretary, American Chemists Society
Director, Chlorine Institute
Adviser on Industrial Alcohol Industry

Solvents

Glenn Haskell, U. S. Alcohol, Company, 42nd Street,
New York City
M. F. Chase, Commercial Solvents Corporation,
New York City

Alkalies

E. M. Allen, Mathieson Alkali Works, New York City
Irving Taylor, Michigan Alkali Co., 42nd St., New York City
A. B. Chadwick, Semet-Solvay Company, New York City
Chas. Millard, General Chemical Company, New York City
Harold Alquist, Consulting Engineer, 331 Madison Ave., New York City
Mr. Stauff, Semet-Solvay Company, New York City

^{1/} Garvan, Francis P., "A Proposed Reciprocal Trade Treaty Between the United States and Switzerland," published by "The Chemical Foundation, Inc.," (1935) pp. 109 ff.

Sulphuric Acid

Henry Merriam, General Chemical Company, New York City
Howard Mansfield, Graselli Company, Cleveland, Ohio.

Dynamite

Mr. Higgins, Hercules Powder Company, New York City

Heavy Chemicals

Chas. Belknap, Merrimac Chemical Company, Everett, Mass.

Fine Chemicals

George Merck, 161 - 6th Avenue, New York City

Potash

Horace Albright, Canadian Pacific Building, New York City

Foreign Trade

William Buffam, Chemical Foundation, Madison Ave., New York City
Francis Garvan, Chemical Foundation, Madison Ave., New York City

Chlorine

Robert T. Baldwin, Chemists Club Building,
52 East 41st St., New York City

Carbon Dioxide

George Pettee, Carbon Dioxide Institute,
Grand Central Bldg., New York City

Nitrogen and Nitrate of Soda

Chaplin Tyler, DuPont Company, Wilmington, Del.

Coal Tar Products

Henry Atherton, President, Allied Chemicals Corp., New York City
Willard Dow, Dow Chemical Company, Midland, Michigan
Orlando Weber, c/o Allied Chemicals Corp., New York City

General

Caesar Proto, Economist, DuPont Company, Wilmington, Del.
Dr. William J. Hale, Cosmos Club, Washington, D. C.,
formerly consultant for the Dow Chemical Company
Hans Clarke, Medical Center, New York City, formerly
consultant for the Eastman Kodak Company
Sidney Kirkpatrick, Editor, Chemical and Metallurgical
Engineering, 42nd Street, New York City

APPENDIX

APPENDIX

TABLE I

Value of Production, by Principal States, of Industries Which Use Chemicals as
a Raw Material: - Fertilizer Industry

State	1929			1931			1933		
	Number of Estab- lishments.	Value (Thousands)	Number of Estab- lishments.	Value (Thousands)	Number of Estab- lishments.	Value (Thousands)	Number of Estab- lishments.	Value (Thousands)	
Total	638	\$232,511	599	\$154,350	522	\$ 94,939			
Georgia	125	29,253	116	18,542	84	8,827			
Maryland	39	25,507	35	17,806	37	12,611			
North Carolina	79	22,956	68	15,244	57	9,197			
Virginia	42	20,662	40	14,473	43	10,078			
Florida	24	15,760	25	11,746	29	8,812			
All Other States	329	118,373	315	76,539	272	45,414			

Source: Census of Manufactures, "Fertilizers."

APPENDIX

TABLE II

Value of Production, by Principal States, of Industries Which Use Chemicals as a Raw Material: - Petroleum Refining Industry

State	1929		1931		1933	
	Number of of Estab- lishments.	Value (Thousands)	Number of Estab- lishments.	Value (Thousands)	Number of Estab- lishments.	Value (Thousands)
Total	390	\$2,639,665	376	\$1,524,285	389	\$1,378,637
California	54	484,756	58	249,161	48	212,939
New Jersey	10	297,151	10	168,978	8	130,975
Oklahoma	48	183,682	41	82,998	43	74,255
Pennsylvania	48	243,259	42	172,894	37	165,516
Texas	83	519,005	82	310,337	90	298,081
All Other States	147	911,812	143	539,917	163	496,871

Source: Census of Manufactures: "Petroleum Refining."

APPENDIX

TABLE III

Value of Production, by Principal States, of Industries Which Use Chemicals as
a Raw Material: - Paint and Varnish Industry

State	1929		1931		1933	
	Number of Estab- lishments.	Value (Thousands)	Number of Estab- lishments.	Value (Thousands)	Number of Estab- lishments.	Value (Thousands)
Total	1,063	\$563,976	1,039	\$350,726	961	\$289,442
Illinois	110	90,599	108	50,431	101	40,261
Massachusetts	44	43,693	43	25,447	42	8,921
New Jersey	88	82,293	95	55,363	96	46,110
New York	166	89,420	178	54,714	151	44,843
Ohio	106	63,686	100	34,448	91	26,956
Pennsylvania	106	48,966	98	32,366	88	25,865
All Other States	443	150,319	417	97,957	392	96,486

Source: Census of Manufactures. "Paints and Varnishes."

APPENDIX

TABLE IV

Value of Production, by Principal States, of Industries Which Use Chemicals as a Raw Material: - Rayon and Synthetic Yarn Industry

State	1929		1931		1933	
	Number of Estab- lishments.	Value (Thousands)	Number of Estab- lishments.	Value (Thousands)	Number of Estab- lishments.	Value (Thousands)
Total	29	\$149,546	32	\$132,632	34	\$156,932
Tennessee	4	25,188	<u>a/</u>	<u>a/</u>	<u>a/</u>	<u>a/</u>
Virginia	<u>a/</u>	<u>a/</u>	<u>a/</u>	<u>a/</u>	7	36,980
All Other States	25	124,358	32	132,632	27	119,952

Source: Census of Manufactures, "Rayon and Allied Products."

a/ To avoid disclosures, data for this State have been included in "All Other States."

APPENDIX

TABLE V

Value of Production, by Principal States, of Industries Which Use Chemicals as a Raw Material: - Glass Industry

State	1929		1931		1933	
	Number of Estab-lishments.	Value (Thousands)	Number of Estab-lishments.	Value (Thousands)	Number of Estab-lishments.	Value (Thousands)
Total	263	\$303,265	229	\$216,265	213	\$191,948
Illinois	13	22,938	13	19,483	11	14,851
Indiana	26	34,450	24	27,086	19	22,521
Ohio	25	39,509	24	32,084	22	30,981
Pennsylvania	70	81,050	61	50,335	55	43,542
West Virginia	48	48,385	41	32,444	43	31,325
All Other States	81	77,093	66	53,833	63	48,728

Source: Census of Manufactures, "Glass."

APPENDIX

TABLE VI

Value of Production, by Principal States, of Industries Which Use Chemicals as
a Raw Material: - Soap Industry

State	1929		1931		1933	
	Number of Estab- lishments.	Value (Thousands)	Number of Estab- lishments.	Value (Thousands)	Number of Estab- lishments.	Value (Thousands)
Total	282	\$310,191	248	\$257,719	235	\$200,128
California	33	19,842	28	16,910	32	13,243
Illinois	32	28,243	28	19,555	23	19,300
New York	44	30,404	39	28,883	35	18,102
Ohio	22	45,241	17	30,065	17	22,760
Pennsylvania	30	14,571	27	13,271	25	8,088
Rhode Island	7	1,054	6	524	5	393
Indiana	a/	a/	7	24,308	7	25,173
All Other States	114	170,856	96	124,203	91	93,069

Source: Census of Manufactures, "Soap."

a/ To avoid disclosures, data for this State have been included in "All Other States."

